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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

SOME INSECT ENEMIES OF THE CYPRESS

IN SOUTHERN CALIFORNIA

by

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## by

Sooner or later in every cypress planting will be noticed yellowing or reddening branches, tops and entire trees. When this is caused by the work of bark beetles, the engraver-like egg galleries and larval mines will be found under the outer bark in the inner bark and outer surface of the wood. If the broods have developed and the young beetles have emerged, the outer bark will be marked with many small shot-like holes. New attacks are indicated by sawdust-like borings on the bark and on the ground at the base of the trunk.



The work of the two species of bark beetles is about the same, but there is enough difference to enable the close observer to tell them apart. Both species make nearly vertical egg galleries ~~in~~ the trunk of the tree through the inner bark and outer surface of the wood, laying their eggs in niches in the sides of the galleries. The white grubs hatching from the eggs mine out through the inner bark for several inches from the sides of the galleries. When growth is completed most of the grubs of P. cristatus excavate cells in the outer wood in which they transform to pupae and then to beetles.. The grubs of P. cupressi excavate their pupal cells in the bark.

The P. cristatus beetles are armed at the hind end with a single row of prominent tubercles on each wing cover, those of the male being more prominent and bead-like than those of the female. The P. cupressi beetles are armed at the hind end with two rows of tubercles on each wing cover, the inner rows of the male stopping at the upper tip of the wing cover.

The main attack of P. cristatus takes place during the late spring or early summer. Most of the individuals developing from this attack winter over as larvae in pupal cells in the outer wood. Some, however, become beetles and emerge during the fall. There is thus one complete and a partial second generation each year.

P. cupressi appears to be able to develop faster than P. cristatus, and there may be more than one generation each year. The main attack probably takes place in the spring.

Apparently the two species prefer different types of climate. P. cristatus is found in the drier areas and P. cupressi in the fog belt. In March 1931 P. cristatus was found at Newhall, San Fernando, Chatsworth, Pasadena, San Gabriel, Uplands, Etiwanda and Rialto, with twig-pruning, apparently by this species, at Riverside and Redlands. P. cupressi was found at Santa Barbara, Montecito, Limoneira, Santa Paula, Saticoy, Oxnard, Whittier, Lemon Heights, Irvine, Carlsbad, Escondido and Del Mar. Dying trees which appeared to be the work of P. cupressi were seen at Summerland, Ventura and San Diego.

Both species are able to kill perfectly healthy trees or parts of trees, and do so at times. Usually, however, they confine their attacks to trees that are suffering from loss of vigor. All trees, however, lose a certain amount of vigor when periods of unfavorable conditions come, and are liable to attack.

At the present time there are many dying cypress in southern California. These trees are producing large broods of beetles, which upon emerging, sometimes swarm into nurseries, hedges or windbreaks and kill numbers of trees.

As yet we do not know of any repellent or killing spray or dust which will prevent or control the attack of the bark beetles. Cutting and burning all infested trees would destroy many beetles and is a promising sanitary measure. It should be carried out as part of a community program.

Investigations should be carried on to determining the possibility of developing a repellent spray or dust, or other means of protecting the individual tree.



The Cypress Bark Moth  
Laspeyresia cypressana (Kearfott)

The cypress bark moth is another native insect whose work, as indicated by borings on the outer bark, somewhat resembles that of the bark beetles. Usually, however, there is a considerable flow of resin and the bark is roughened. There are no egg galleries in the inner bark, but numerous short pitchy larval mines. The damage is caused by the rather smooth, dirty-white, dark-brown-headed caterpillar, about 2/3-inch long, which is usually found in the inner bark.

The species does not work as quickly as the bark beetle, and the work in the bark will be going on for several years before the tree dies.

There appear to be two generations of the bark moth each year. The nearly circular, translucent, white or reddish, scale-like eggs of the first generation are laid on the bark at the edge of a wound during the springtime. A small caterpillar hatches from the egg in a few weeks and mines into the inner bark until late summer, when it becomes full-grown, and pupates in the silk-lined end of the mine near the outer surface of the bark. The pupa wriggles out through the bark in a few weeks and the moth emerges, mates and lays the eggs which produce the second generation of worm-like caterpillars. These mine the bark during the winter. The moth is about one-quarter of an inch long, with a wing spread of about one-half inch. The color is dark smoky brown, with lighter, shiny, metallic bars on the fore wings.

Both small and large trees are killed by the mining of the bark moth caterpillar. The species is also under suspicion of spreading the new, destructive cypress blight. Work of this species was found at Irvine, Covina and Carlsbad.

So far no efficient control method has been demonstrated. An oil and nicotine spray applied when the eggs are laid should give good results.

The Cedar Flathead Borer  
Chrysobothris nixa Horn

The work of this species is indicated by long, rather broad, shallow, winding mines through the inner bark and outer surface of the wood of the trunks of small and large trees. The mine is usually filled with dust-like borings. Often the tree is girdled and dies. Sometimes only one side or part of the trunk is killed, and a rough open wound is formed. New work is usually marked by an exudation of resin, old work by the cracking of the bark, which exposes the mines beneath, and by the oval holes through which the brood of young beetles emerged.

The species is a native, and in the forests lives in the incense cedar. Planted cypress were found attacked at Esccondido and El Cajon Valley, San Diego County. Arborvitae is attacked in northern California.



The larva which makes the mine is about  $7/8$  inch long when full-grown, white, with a large head and thorax and a smaller, slender, tail-like abdomen. The adult beetle is about half an inch long, oblong-oval, flattened, dark brownish-bronze, with three longitudinal ridges on each wing cover. The eggs are flattened disks and are laid between the bark scales. Pupation and transformation to the adult stage usually take place in a cell in the outer wood. The entrance to this cell is closed with a plug of sawdust-like wood borings, which the adult removes when it emerges.

The eggs are laid during late spring and summer. Many of the larvae hatching from them become full-grown by the end of fall and overwinter in the pupal cells. Others feed during the winter and go into the pupal cells in the spring. All pupate and transform to young beetles, which emerge during the late spring or early summer.

Burning infested trees in the spring before the new brood of beetles emerges is one method of control recommended. Felling and splitting infested material and placing it in the direct rays of the sun would probably kill the infesting insects.

The Cypress Roundhead  
Atimia dorsalis Lec.

Many dead cypress trees have the winding mines of this species marking the inner bark and outer surface of the wood of their trunks. The work resembles that of the flathead borer, but the mine is narrower and usually marks the surface of the wood a little more deeply. The full-grown larva, when it goes into the outer wood to excavate the pupal cell, plugs the entrance with shredded borings instead of the sawdust-like borings of the flathead.

The eggs of the species are supposed to be laid in crevices of the bark of dying trees in the spring. The borers hatching from them mine the inner bark and outer surface of the wood until fall, when they enter the wood, pupate and transform to the adult beetle. The beetle stays in the pupal cell all winter, emerging in the spring to mate and lay the eggs which start the new generation. There is some evidence to indicate that it may take two years instead of one for some of the larvae to become full-grown.

The full-grown larva is rather cylindrical, white, about  $5/8$  inch long, with dark jaws and two small dark spines on the back near the tip of the body. The spines are separated about  $1/64$  inch. The adult is a somewhat cylindrical beetle  $3/8$  to  $7/16$  of an inch long, rather prettily mottled with brown and grayish tan.

Since, so far as we know, this species does not cause any damage to living trees, there is no need for control. Cutting out and burning all dying trees in the control of other species would prevent it from becoming common.

Specimens were found at Rialto, Uplands and Del Mar.



The Cypress Bark Scale  
Ehrhornia cupressi (Ehr.)

Where first one branch and then another of a cypress tree in a hedge or windbreak turns yellow and then red <sup>and</sup> brown, it usually is safe to suspect this species. The secretion of white cottony wax protruding from crevices of the bark along the under side of the twigs and branches, and even on the trunk, is abundant evidence of its presence.

The damage is caused by the presence of thousands of small, brown, nearly circular, convex insects, not over 1/12 inch in diameter. Their continual sucking of the sap slowly but surely kills the tree unless natural or artificial control takes place.

The species passes the winter on the bark in the young female stage. The eggs are laid from the first of April to the last of September under the waxy wool at the tip of the body. They hatch in about half an hour after being laid. As soon as hatched the young larvae crawl around over the bark searching for a crevice or other suitable place to attach themselves. As soon as they become attached they start sucking and growing, and secrete a mass of white cottony wax to cover themselves. The female larvae moult twice, to become full-grown in the third stage. The full-grown second-stage male larvae detach themselves and crawl around, looking for a suitable place for pupating. Under some bark scale or cottony mass each settles and proceeds to spin a white woolly cocoon about 1/25 inch long, in which it goes through a prepupal and pupal stage before transforming to a small, light-brown, two-winged insect. The wings are transparent white, and there are two long white wax filaments projecting from the tip of the body. The males appear in the late fall, being most abundant in October and November. Mating takes place then, and the young fertilized females carry the species over the winter.

The bark scale was found at Covina, Los Nietos and Carlsbad. It attacks Monterey, Arizona and Guadalupe cypress, and incense cedar. Spraying with oil and nicotine in August where the infestation is heavy, and again the latter part of September, should give good control.

The Redwood Mealybug  
Pseudococcus sequoiae (Coleman)

At times this species becomes so common that sections of a hedge look as though covered with snow. Under such conditions considerable damage is caused. Branches may be killed, and the great numbers of insects with their secretion of sticky honeydew make the whole anything but ornamental or a pleasure to the owner.

So far as known, the life history and habits are about the same as those of other species of mealybugs. Apparently all stages of the insect can be found any time during the year. According to the writer's observations, the species occurs in greatest numbers early in the year. The eggs are laid in a white, waxy ovisac secreted by the female. They soon hatch, and the young larvae crawl out on the new growth and start sucking and growing. Just how many generations there are in a year is not known.



Apparently the species occurs throughout the coast region of California. Agricultural Inspector Smith reports that it sometimes causes considerable trouble to cypress hedges in Santa Barbara County.

The species infests redwood as well as the Monterey cypress.

Inspector Smith says that oil sprays and the introduction of the coccinellid, Cryptolaemus montrouzieri Mul. give good control.

The Arborvitae Aphid  
Dilachnus tujafilinus (Del G.)

This introduced European species is said by Manager Jensen of the Limoneira Ranch at Santa Paula to be one of the worst pests of the cypress hedges on the ranch. Apparently it is more common where the growth is densest. Beside injuring the tree by sucking the sap, the insect gives off a quantity of honeydew which supports a sooty, smothering mold.

The life history appears to be similar to that of most aphids. Colonies may be found on the bark of twigs and branches almost any time during the year, but the greatest numbers appear during the more humid seasons.

The species is brown with some darker stripes down the back.

It occurs on arborvitae and apparently on Japanese cypress as well as on Monterey cypress.

Specimens were found at Santa Barbara, Santa Paula and Pasadena.

Manager Jensen of the Limoneira Ranch reports good control from the use of a spray composed of  $1\frac{1}{2}$  to 2% lime sulphur and 1 pint of nicotine sulphate to 100 gallons of water, applied whenever the work of the insect becomes noticeable. Any oil and nicotine spray should also be satisfactory.

The Cypress Tip Moth  
Argyresthia cupressella Wlsh.

The work of this species on the foliage causes many trees to look as if scorched. Numerous individual tips of twigs are mined and killed. The work is more conspicuous in early spring before the new growth comes out.

The insect causing the trouble is the larva of a small moth with a wing spread of about  $\frac{1}{3}$  inch. The color of the moth is golden-brown. The thorax is white, and the fore wings are marked with some darker cross bars and a small black spot near the tip. The full-grown larva is about  $\frac{1}{4}$  inch long, salmon-colored, with a brown head. The cocoon is about  $\frac{1}{5}$  inch long, slightly pointed at both ends, lead-colored and papery. The egg is about  $\frac{1}{32}$  inch long, yellowish-green, turning to reddish or pink, strongly convex and slightly elongate.



Apparently the species winters over as a small larva in the tips of the twigs. Most of the feeding and growing is done in the spring. The larvae leave the tips in March or April and spin cocoons on the twigs. The moths emerge about two weeks later and lay eggs on the scales of the twigs, usually along the suture between two scales. The eggs are supposed to hatch in about two weeks, but there is little sign of infestation until the next spring.

The species appears to attack all species of cypress. It has been found in most of southern California.

An oil and nicotine spray applied to the foliage about the first of May to kill the eggs should give control.

The Cypress Webber  
Epinotia subviridis Hein.

Usually working along on the same foliage with the tip moth is another rather small caterpillar which webs together several twigs to form a silk-lined nest. Foraging out from this nest the caterpillar gnaws web-lined trails through the foliage. Considerable foliage is killed and turns brown, and often large twigs are gnawed so that they break over.

The tip moth has a wing spread of about  $4/5$  inch. The head is creamy ochreous, the thorax and fore wings are greenish-gray marked by patches of dark gray-brown, bordered with darker brown lines. The abdomen and hind wings are pale light tan. The egg is  $1/30$  inch long, oval, flattened, translucent yellow-white, turning to salmon. The full-grown larva is  $3/5$  inch long, brownish-green with some scattered light hairs and three or four light tubercles on each side of most of the segments. The shield of the first segment is prominent and bordered behind with black. The pupa is formed in the cocoon-like nest of webbed twigs, but wriggles part way out just before the moth emerges.

The species winters over as a small larva in a webbed nest on the foliage. Most of the feeding and growing appears to take place in the spring. The larva becomes full-grown some time between the middle of February and the middle of May, and pupates in the nest. In about two weeks the moth emerges and lays its eggs singly on the scales of the twigs. The eggs are supposed to hatch in about two weeks, and the larva feeds on the foliage, forming a tight nest of webbing and chewed bits of foliage.

Apparently all species of cypress and the arborvitae are attacked by the pest. Specimens were found throughout southern California.

Spraying the foliage during May with oil and nicotine should give good control.



The Cypress Sawfly  
Neodiprion? sp.

Sometimes stripping cypress trees of their foliage is a dark green and white striped false caterpillar of an undetermined sawfly. The caterpillar is so protectively colored that the ordinary observer would never notice one on the living foliage. Probably the greatest damage is done to young trees in the nursery, or soon after they are transplanted to the field.

The full-grown larva is about 1. inch long, dark green mottled with lighter spots, and apparently with two light stripes along the sides. The head is dark-brown and the bases and tips of the true legs are blackish.

Apparently the species winters over as a full-grown larva in a tough, light-yellowish cocoon. Early in the spring the sawflies probably emerge from the cocoons and fly to the foliage. The eggs are laid in slits sawed in the tips of the small twigs. The larvae soon hatch from the eggs and feed on the foliage until about the middle of May, when they become full-grown and spin cocoons down near the base of the tree.

The species attacks Monterey, Italian and probably other species of cypress. Specimens were found at Montecito, Pasadena, Altadena, Glendale, San Gabriel, Rialto and Escandido.

An arsenical spray applied in the spring will give good control.

Stanford University, Calif.,  
May 19, 1931.





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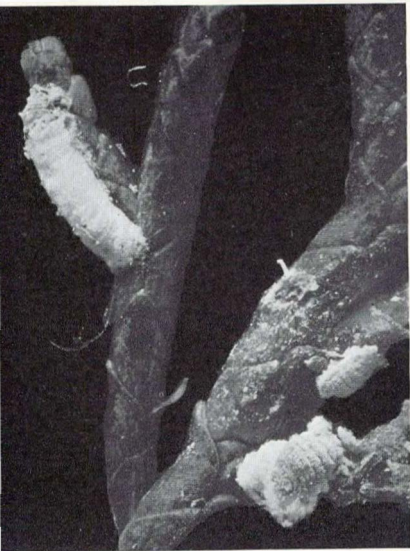
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